REMARKS

In response to the Office Action mailed October 30, 2003, Applicants request reconsideration. No claims are proposed to be added, cancelled, or amended so that claims 1-12 remain pending.

The invention concerns a solid state laser apparatus including a solid state laser element and a semiconductor laser that pumps the solid state laser element. A power supply supplies power driving the semiconductor laser. An important feature of the invention, appearing in the two independent claims, claims 1 and 12, is that this power supply produces pulses of current that change in magnitude *during each pulse*. The reason the pulses are changed in magnitude during the pulse, as described in the patent application, is to make the output light from the solid state laser element uniform in magnitude as a function of time. The solid state laser apparatus of claim 1 differs from the solid state laser apparatus of claim 12 in that the apparatus of claim 1 also includes an optical resonator for the solid state laser element.

Among the dependent claims, claim 7 further specifies that the apparatus includes a diffusive reflector enclosing the solid state laser element and having an inner surface diffusing and reflecting the excitation light. Further, that apparatus includes an optical waveguide element. The optical waveguide element guides the excitation light from the semiconductor laser into the diffusive reflector and repeatedly totally reflects the excitation light. The apparatus according to dependent claim 8 includes a cooling plate and specifies that the solid state laser element has a rectangular cross-section.

Claims 1-12 were rejected as indefinite for failure to include an essential element of the claimed invention. The Office Action identifies as the omitted element a control means for controlling the current supplied to the semiconductor laser. Applicants respectfully traverse this rejection.

As described in the pending claims and as described in the patent application, the changes in the magnitudes of the respective pulses is controlled by the power supply. The patent application does not describe any control means that is separate from the power supply and provides the variation in magnitude of the pulses, during the pulses. Adding a limitation to the claims, claiming a control means that is not described in the patent application, would open the claims to a potential rejection pursuant to 35 USC 112, first paragraph. Further, since the patent application and the claims describe the control exercised by the power supply in generating the pulses having magnitudes varying within each pulse, the claims are complete and meet the requirements of 35 USC 112, second paragraph. Accordingly, upon reconsideration, the rejection as to form should be withdrawn.

Claims 1-12, were rejected as anticipated by Berger et al. (U.S. Patent 4,794,615, hereinafter Berger). This rejection is respectfully traversed.

Berger concerns a solid state laser apparatus in which a solid state laser element is pumped with light produced by a semiconductor laser. In fact, the pumping light is produced by more than one semiconductor laser, an important feature of the apparatus described by Berger. Berger emphasizes in columns 5 and 6 the use of the two pumping light sources. As illustrated by the examples C and F in the table of Figure 6 of Berger, the best output results, in terms of the uniformity of the output light of the solid state laser element, is achieved when one pumping light source produces continuous wave (cw) radiation and one pumping light source produces pulsed pumping light. (Continuous wave light is steady uninterrupted pumping light of constant magnitude.) In fact, in all examples illustrated in Figure 6 of Berger, one of the light sources produces continuous wave light and the other pumping light source produces either continuous wave light or pulsed light.

The advantage reported by Berger is that the continuous wave light source pumps the solid state laser element to a level at or near the threshold level of oscillation of the solid state laser element. Then, the pulsed light pushes the excitation beyond the threshold of the solid state laser element, resulting in output of laser light. The output light is improved in uniformity because the continuous pumping light keeps the solid state laser element "hot" and ready to generate light without having to start from a "cold" state in which charge carriers have to be pumped to an excited state before relaxing and producing output light. In the Berger apparatus, carriers are always excited, ready to release light energy upon slight additional stimulation.

There is no description in Berger as to the waveform of the pumping light that is pulsed. Further, there is no suggestion in Berger concerning any particular waveform or shape of the pumping light that is pulsed. Berger mentions at column 6, lines 55-59 that the side pumping laser diode array 14 can be modulated at high speed. Berger further states that any change in the amplitude of the pumping pulses results in a corresponding change in the intensity of the amplified laser pulses, i.e., the pulses output by the solid state laser element. This description suggests that pulses in a pulse train change in magnitude from pulse to pulse. There is no suggestion that individual pulses have the waveform characteristic described in claims 1-12. Therefore, there is not even an suggestion in Berger for the invention. In other words, Berger neither anticipates nor makes obvious any of claims 1-12.

According to the Office Action it is inherent that each pulse in Berger changes in magnitude during the pulse because otherwise it would not be possible to switch from the off-level to the on-level of the pulse, and back again. This statement suggests that the language of the claims may not have been interpreted accurately. In a pulse train, there are numerous individual pulses that follow each other and are spaced in time from each other. Inherently,

there are alternating on and off periods that define each pulse. What is described as the claimed invention is not the generation of a pulse train in which power alternatively turns on and off. Rather, the invention is directed to individual pulses in such a pulse train, for example as illustrated in Figures 2(a) and 2(b) of the patent application. Those figures show a single pulse of a pulse train that includes many such pulses. Each pulse is preceded by a current of zero magnitude and followed by a current of zero magnitude.

The invention, as described in the claims, provides that during a pulse, i.e., during an on-time of the current flow, the magnitude of the current changes *during the pulse,* i.e., during the time the current is "on", i.e., flowing. As shown in Figure 2(b), as one example, the current decreases linearly with time during a pulse. The rejection based upon inherency is incorrect because it focuses on a pulse train whereas the invention is focused on individual pulses that constitute the pulse train. Therefore, this ground of rejection cannot be properly maintained.

Further, it is apparent that there is no description within Berger for the physical elements added by pending claims 7 and 8 to claim 1. Thus, because of this additional difference, those claims cannot be anticipated by nor suggested by Berger.

Upon reconsideration, the rejection of claims 1-12 should be withdrawn and those claims should be allowed.

Respectfully submitted,

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